

TEST Wednesday, 5/21

Review R, F 5/22-23

Exam T 5/27

## Confidence Intervals for a Proportion (ch.17)

### • Example:

Candidate 1:  $60\% \pm 5\%$   $\begin{matrix} 65\% \text{ to} \\ 55\% \end{matrix}$

Candidate 2:  $35\% \pm 5\%$   $\begin{matrix} 40\% \text{ to} \\ 30\% \end{matrix}$

Candidate 1 is predicted to win

### • Example:

Candidate 1:  $42\% \pm 4\%$   $\begin{matrix} 46\% \text{ to} \\ 38\% \end{matrix}$

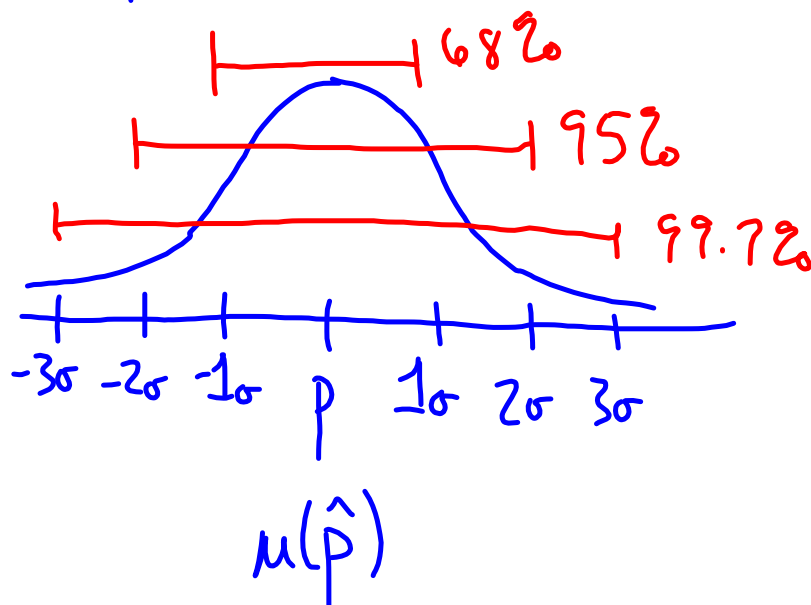
Candidate 2:  $40\% \pm 5\%$   $\begin{matrix} 45\% \text{ to} \\ 35\% \end{matrix}$

"Too close to call"

### • Definitions:

- Sample statistic  $\rightarrow$  information from a particular sample proportion (called  $\hat{p}$ )
- Sampling distribution  $\rightarrow$  set of all all sample proportions from all possible samples
- Sampling distribution model  $\rightarrow$  model for how a sample proportion varies from sample to sample
- Sampling error/sampling variability  $\rightarrow$  variability you expect to see from one sample to another

- Sampling model:



- Mean:  $\mu(\hat{p}) = p$

observed  
proportion  
in data

↪ parameter

- Standard Deviation:

$$SD(\hat{p}) = \sqrt{\frac{pq}{n}}$$

$p$  = parameter

$q = 1 - p$

$n$  = sample size

- Assumptions and Conditions:

1. Independence Assumption  $\rightarrow$  Sampled values must be independent of each other
2. Randomization Condition  $\rightarrow$  Sample should be simple random sample of population.
3. 10% Condition  $\rightarrow$  Sample size ( $n$ ) must be no larger than 10% of the population
- 4a. Sample Size Assumption  $\rightarrow$  Sample size ( $n$ ) must be large enough
- 4b. Success/Failure Condition  $\rightarrow$   
 $np > 10$  and  $nq > 10$